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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/739,309	12/18/2000	James Aweya	57983.000016	3332

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EXAMINER

WILLETT, STEPHAN F

ART UNIT	PAPER NUMBER
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2141

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/739,309

Applicant(s)

AWEYA ET AL.

Examiner

Stephan F Willett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 July 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

1. Acknowledgment is made of applicant's claim for priority of a provisional application under 35 U.S.C. 119(e).

### ***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

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5. *Claim(s) 1-38 is/are rejected under 35 U.S.C. 102(e) as being anticipated by Siu et al. (US Patent No. 6,252,851 and Siu hereinafter)*

6. As per claim(s) 1, 11, 18, 28 Siu discloses organizing a forward data buffer into one or more queues that store at least one forward data packet, (See Column 4 Lines 20-36) and Siu teaches “packets ... not yet sent ... are stored”, col. 6, lines 13-15; calculating the network device's advertised window size by implementing an integral control algorithm that uses information pertaining to the one or more queues, (See Column 6 Lines 29-67); providing the network device's advertised window size to a TCP source, (See Column 6 Lines 55-67) and calculating a dynamic buffer threshold based, at least in part, upon the sum of the queue sizes and the shared buffer space, (See Column 7 Lines 1-51).

7. As per claim(s) 2, 19, 29 Siu teaches the claimed invention as described in claim(s) 1, 18, 28 above and furthermore discloses organizing the forward data buffer into one or more queues with one queue per service class, (See Column 4 Lines 31-35).

8. As per claim(s) 3, 20, 30 Siu teaches the claimed invention as described in claim(s) 1-2, 18-19, 28-29 above and furthermore discloses at least one forward data packet is stored according to its service class, (See Column 3 Lines 52-60).

9. As per claim(s) 4, 12, 21, 31 Siu teaches the claimed invention as described in claim(s) 1-3, 11, 18-20, 28-30 above and furthermore discloses initializing a timer to a predetermined time

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interval  $\Delta t$ , and an iteration counter to a predetermined initial value  $n$ ; sampling a current queue size  $q_i(n)$  during the predetermined time interval  $\Delta t$ , (See Column 10 Lines 10-56); calculating a current error signal  $e_i(n)$  based, at least in part, upon the current queue size  $q_i(n)$ ; calculating the network device's advertised window size  $W_i(n)$ , (See Column 10 Lines 10-56) based, at least in part, upon the current error signal  $e_i(n)$  according to the equation:  $W_i(n)=[W_i(n-1)+\alpha e_i(n)]$ , where  $\alpha$ ,  $W_{\max}$ , and  $W_{\min}$ , are predetermined parameters; resetting the timer, (See Column 10 Lines 10-56) and Siu teaches estimation error, col. 13, lines 34-36 and col. 14, lines 19-20 upon expiration of the predetermined interval  $\Delta t$ ; and iterating the iteration counter, upon expiration of the predetermined time interval  $\Delta t$ , (See Column 10 Lines 10-56).

10. As per claim(s) 5, 13, 22, 32 Siu teaches the claimed invention as described in claim(s) 1-4, 11-12, 18-21, 28-31 above and furthermore discloses filtering the current error signal  $e_i(n)$  according to the relation:  $e_i(n)=(1-\beta)e_i(n-1)+\beta e_i(n)$ , where  $\beta$  is a predetermined parameter; and calculating the network device's advertised window size  $W_i(n)$ , based, at least in part, upon the filtered current error signal  $e_i(n)$  according to the equation:  $W_i(n)=[W_i(n-1)+\alpha e_i(n)]$ , where  $\alpha$ ,  $W_{\max}$ , and  $W_{\min}$ , are predetermined parameters, (See Column 17 Lines 21-61);

11. As per claim(s) 6, 14, 23, 33 Siu teaches the claimed invention as described in claim(s) 1-5, 11-13, 18-22, 28-32 above and furthermore discloses carrying information relating to the network device's advertised window size by returning TCP acknowledgements in a receiver's advertised window field, (See Column 5 Lines 29-67).

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12. As per claim(s) 7, 24, 34 Siu teaches the claimed invention as described in claim(s) 1-6, 18-23, 28-33 above and furthermore discloses providing the network device's advertised window size to a TCP source further comprises: updating a TCP receiver's advertised window size; wherein observer dynamically updates the window size, (See Column 6 Lines 29-67).

13. As per claim(s) 8, 15, 25, 35 Siu teaches the claimed invention as described in claim(s) 1-7, 11-14, 18-24, 28-34 above and furthermore discloses identifying whether a packet is an ACK packet, and, if not, putting the non-ACK packet in a reverse data buffer, (See Column 3 Lines 52-60); determining a service class for the identified ACK packet, (See Column 3 Lines 52-67 & Column 4 Lines 1-30); reading the TCP receiver's advertised window size ( $RW_{rec}$ ) and a checksum (RCHKSUM) from the identified ACK packet; determining whether the TCP receiver's advertised window size  $RW_{rec}$ , is less than or equal to the calculated network device's advertised window size  $W_i(n)$  and, if not setting a advertised window field in the identified ACK packet equal to the network device's advertised window size  $W_i(n)$  and updating the checksum field for the identified ACK packet, (See Column 7 Lines 1-57).

14. As per claim(s) 9, 16, 26, 36 Siu teaches the claimed invention as described in claim(s) 1-8, 11-15, 18-25, 28-35 above and furthermore discloses initializing a timer to a predetermined time interval  $\Delta s$  and an iteration counter to a predetermined initial value  $n$ ; setting an initial dynamic buffer threshold  $T(0)$  equal to a parameter  $\gamma$  multiplied by a buffer size  $\beta$  and divided by a number of service classes  $K$ ; sampling a current queue size  $q_i(n)$  during the predetermined time interval  $\Delta s$ ; calculating a sum of the sampled current queue size according to the equation:

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$Q(n) = \sum_{i=1, K} q_i(n)$ ; determining whether the sum of the sampled current queue size is less than the product of the parameter and the buffer size  $\gamma\beta$ , (See Column 18 Lines 24-65); if so, updating the dynamic buffer threshold according to  $\min \{T(n-1) + \Delta T, \gamma\beta\}$ , where  $\Delta T$  is a step size that controls the rate at which the dynamic buffer threshold changes; if not, updating the dynamic buffer threshold according to  $\max \{T(n-1) - \Delta T, T_{\min}\}$ , where  $T_{\min}$  is a predetermined minimum size for the dynamic buffer threshold; resetting the timer, upon expiration of the predetermined interval  $\Delta s$ ; and iterating the iteration counter, upon expiration of the predetermined time interval  $\Delta s$ , (See Column 14 Lines 1-67 & Column 15 Lines 1-45).

15. As per claim(s) 10, 17, 27, 37 Siu teaches the claimed invention as described in claim(s) 1-9, 11-16, 18-26, 28-36 above and furthermore discloses filtering the sum of the sampled current queue size  $Q(n)$  according to the relation:  $Q(n) = (1-\phi)Q(n-1) + \phi Q(n)$ , wherein  $\phi$  is a predetermined parameter; wherein it is inherent that the relation is similar to the reference in that the sampled queue size  $q^*(n)$  is the same as  $Q(n)$  wherein a filtration occurs when applying the relation to a residual queue, (See Column 12 Lines 60-67).

16. As per claim(s) 38 Siu teaches the claimed invention as described in claim(s) 1-37 above and furthermore discloses a computer data signal embodied in a carrier wave readable by a computing system and encoding a computer program of instructions, (i.e., application) for executing a computer process (i.e., process with in a router which contains a computer of some type) performing the method recited in claim 1, (See Column 1 Lines 1-47).

***Response to Amendment***

1. The broad claim language used is interpreted on its face and based on this interpretation the claims have been rejected. Based on this broad language, typically numerous of the components would read on the broad language, however, clarity has been provided.
2. The limited structure claimed, without more functional language, reads on the references provided. Thus, Applicant's arguments can not be held as persuasive regarding patentability.
3. Applicant suggests "no mention of made that this is a forward data buffer or that it stores forward data", Paper Filed 7/28/04, Page 2, lines 22-24. Clearly, these are inherent elements of a buffer, however, Siu teaches "packets ... not yet sent ... are stored", col. 6, lines 13-15. Thus, Applicant's arguments can not be held as persuasive regarding patentability.
4. Applicant suggests "information pertaining to the queue size", Paper Filed 7/28/04, Page 3, lines 17-18 is not taught. The above argument is not commensurate with what is presently claimed and therefore will not be considered at this time. However, size is increased based on "information pertaining to the one or more queues". Thus, Applicant's arguments can not be held as persuasive regarding patentability.
5. Applicant suggests "upon the error signal", Paper Filed 7/28/04, Page 4, lines 17-18 is not taught. However, Siu teaches estimation error, col. 13, lines 34-36 and col. 14, lines 19-20. Thus, Applicant's arguments can not be held as persuasive regarding patentability.

***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.



- a. Ghani et al. (US Patent No. 6,215,769) discloses Enhanced acknowledgement pacing device and method for TCP connections;
  - b. Silberschatz et al. (US Patent No. 6,556,578) discloses an early fair drop buffer management method;
  - c. Raza et al. (US Patent No. 6,625,711) discloses method and/or architecture for implementing queue expansion in multiqueue devices;
6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
7. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephan Willett whose telephone number is (571) 272-3890. The examiner can normally be reached Monday through Friday from 8:00 AM to 6:00 PM.
9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia, can be reached on (571) 272-3880. The fax phone number for the organization where this application or proceeding is assigned is (571) 272-0044.

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10. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2100.

sfw

November 19, 2004

  
RUPAL DHARIA  
SUPERVISORY PATENT EXAMINER